

PATENT COOPERATION TREATY

from the
INTERNATIONAL SEARCHING AUTHORITY

PCT

To:

see form PCT/ISA/220

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY
(PCT Rule 43bis.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/GB2005/000262

International filing date (day/month/year)
27.01.2005

Priority date (day/month/year)
28.01.2004

International Patent Classification (IPC) or both national classification and IPC
A61K7/42, A61K33/24, C08K3/22

Applicant
OXONICA, LTD

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☒ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

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**WRITTEN OPINION OF THE
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Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
 - ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
 - ☐ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b. format of material:
 - ☐ in written format
 - ☐ in computer readable form
 - c. time of filing/furnishing:
 - ☐ contained in the international application as filed.
 - ☐ filed together with the international application in computer readable form.
 - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

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Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	23,25,29
	No: Claims	1-22,24,26-28,30
Inventive step (IS)	Yes: Claims	
	No: Claims	1-30
Industrial applicability (IA)	Yes: Claims	1-30
	No: Claims	

2. Citations and explanations

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

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AUTHORITY (SEPARATE SHEET)**

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Re Item V.

1. Reference is made to the following documents:

- D1: US-A-2003/138386
- D2: US-A-5 733 895
- D3: US-A-5 690 917
- D4: US-A-5 788 952

2. Novelty and inventive step

Compositions comprising components susceptible to free radical attack and metal oxide nanoparticles or rare earth metals and transition metals are already known in the art.

- 2.1 D1 describes particles of size 1 to 200 nm (preferably, < 50nm) for ultraviolet screening composition for use in cosmetics and paints which comprises host lattice preferably being TiO₂ or ZnO and a second dopant component of niobium, vanadium, antimony, tantalum, strontium, calcium, magnesium, barium, molybdenum or silicon which provides luminescence trap sites ([0016]; claims 1, 3, 6, 16, 17 [0037]). The particle may have an outer coating such as an oxide of Zr (claim 8). Biocides may be optionally added to the composition ([0046]).

The compositions can be effectively used to protect UV sensitive components (a) to (j), also claimed in the present specification ([0025] to [0035]).

The production of hydroxyl radicals may be substantially prevented using said particles ([0015]).

D2 relates to a screening cosmetic composition comprising, in a cosmetically acceptable carrier, 0.1-15 wt.-% of at least one nanopigment of metallic oxides selected from the group consisting of titanium, zinc, cerium, zirconium and iron oxides and mixtures thereof, with a mean diameter of < 100 nm (preferably, 5-50 nm), and at least one polymer carrying at least one ultraviolet-absorbing group selected amongst liposoluble having a hydrocarbonated structure and polymers with a siloxane structure consisting of diorganopolysiloxane containing in their molecule at least one unit of the given formula (abstract; claims 1, 2, 4).

The preferred ultraviolet-absorbing groups comprise benzylidenecamphor and hydroxyphenylbenzotriazole residues as components in the polymers being

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susceptible to free radical attack (columns 3 & 4; claims 6, 7). Such residues are also described in the current application as being organic sunscreen agents adversely effected by free radicals (see pgs. 9-11, claims 10, 11).

The said cosmetic composition is an anti-sun composition and is provided in the form of a lotion, a thickened lotion, a gel, an oil, a vesicular dispersion, a cream, a milk, a powder, a solid stick, a foam or a spray (claim 10).

The Examples describe compositions comprising nanoparticulate metal oxides both coated and uncoated including titanium oxide and cerium oxide.

D3 discloses a screening cosmetic composition comprising, in a cosmetically acceptable carrier, a metal oxide nanopigment (preferably, cerium oxide) having with a mean diameter of less than 100 nm but greater than 5 nm, admixed with partially or completely neutralized 1,4-benzenedi(3-methylidene-10-camphosphonic) acid of the given formula (Examples; claims 1, 7). The said camphor derivative is mentioned in the application as being an organic sunscreen agent adversely effected by free radicals (see pg. 10, claim 11).

In D4 cosmetic and dermatological sunscreen formulation comprising inorganic micropigments contains oxides or mixed oxides of metals advantageously having particle diameters of less than 100 nm which are selected from the group consisting of titanium, zinc, iron, zirconium, silicone, manganese, aluminum, or cerium is described (col. 3, l 28-39; claims 1, 3).

The compositions also comprise UVB filters, known as UV sunscreen agents adversely effected by free radicals in the application, favoured in the application (col. 5).

Thus in view of the cited prior art, the subject-matter of claims 1-22, 24, 26-28, and 30 is not considered to be novel according to Article 33(2) PCT.

- 2.2 The advantageous use of nanoparticles falling under the scope of claim 1 is known in the art to prevent formation and effects of free radicals in compositions such as sunscreens and the like from D1. Hence, the underlying idea of the present application is already known in the art, such that an inventive step under Article 33(3) PCT cannot be acknowledged.

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Re Item VIII.

1. Claim 26 is superfluous and contains no further technical features (Article 6 PCT).
2. The formulation "to reduce the concentration of one or more components susceptible to free radical attack" in claim 27 is unclear and ambiguous, such that the scope of protection sought is neither supported by the description of known from said claim (Article 6 PCT).
3. Contrary to the requirements of Rule 5.1(a)(ii) PCT, relevant background art is not mentioned in the description.